

### **REMARKS**

This responds to the Office Action mailed on February 24, 2005.

Claims 1, 12, 17, and 23 are amended, and no claims are canceled or added; as a result, claims 1-33 remain pending in this application.

#### **§112 Rejection of the Claims**

Claims 17-22 were rejected under 35 U.S.C. § 112, second paragraph, for indefiniteness. Claim 17 is amended, and Applicant submits that this rejection has been overcome.

#### **§102 Rejection of the Claims**

Claims 1-10 and 12-31 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Chester (U.S. 5,717,617). Applicant respectfully, yet strongly, disagrees.

As discussed below, the logic in the Office Action relating to variations “by virtue of the possible presence [of] drift” is inappropriate. Nevertheless, Applicant has clarified the claims to indicate the sample rate is “controllably varied”.

It is submitted that the following limitations of claim 1 are neither described nor even suggested in Chester:

*“converting an input signal to one of a plurality of differing output sample rates”*

*“varying said input sample rate ... to any one of the plurality of differing output sample rates”*

*and*

*“said output sample rate is capable of being controllably varied to any one of said plurality of differing output sample rates for any output data sample.”*

**The Examiner presented Chester in the Office Action of May 24, 2004 and confirmed that “Chester does not specify that said output sample rate is capable of being varied to any one of said plurality of differing output sample rates for any output data sample.” The present Office Action now incorrectly submits that submits Chester does disclose**

this limitation. As previously communicated, Chester presents a method of sample rate conversion by **fixed, non-variable ratios**, whose values are such that application of earlier techniques is inefficient. Such ratios are those involving prime numbers, or numbers without small integer factors (such as multiples of 2 or 3). For example, Chester's first embodiment uses an example factor of decimation by the prime 61, as beginning at Col. 3 line 14.

For the purposes of the arguments in the present Office Action, Chester does not offer anything that is not already established in the art prior to Chester. It has been well known for decades that cascading sections of **fixed** "interpolators" and "decimators" is an efficient way to implement sample rate converters.

An example of a key difference between the invention as claimed in claim 1 and the teachings of Chester and related prior art is that the present invention allows, within a single architecture, the selection of an arbitrary sample rate ratio, and the capability to arbitrarily vary that ratio on an output sample by output sample basis. Thus, the sample rate may be controllably varied.

Any reading of Chester or the related prior art reveals that for each sample rate ratio, **Chester requires construction of a new architecture in which the coefficients for the filters, the number of stages, and the values of L and M must be readjusted.** He gives no indication whatsoever that this can be done while operating on the same input sequence. As previously communicated, this fact is made clear in a number of places in Chester's specification, such as the description and table beginning at column 4 line 46.

The Office Action submits that Chester's architecture reads on "a method for converting an input signal to one of a plurality of differing output rates." However, this limitation cannot be read in isolation and must be read in conjunction with "*varying said input sample rate ... to any one of the plurality of differing output sample rates*" and "*said output sample rate is capable of being controllably varied to any one of said plurality of differing output sample rates for any*

*output data sample.*” Clearly, Chester’s disclosed architectures are each described as converting a signal to one and only one output sample rate.

The submission in the Office Action that “the upsampling performed by the interpolation (L2) reads on ‘*varying said input sample rate associated with said input signal to any one of the plurality of differing output sample rates*’ ” is clearly incorrect. The Office Action in this case refers to Chester column 6, lines 56-67. In the previous text regarding this example, Chester tells us in column 6 lines 33-34 that he is designing an interpolator with a specific interpolation rate  $L_x$ . Chester goes on to tell us in lines 46-50 that we must choose a value  $L$  based on  $L_x$ , and having factors  $L_1$  and  $L_2$ . He then reiterates in lines 50-51 that the output frequency  $F_{out}$  equals  $L_x F_{in}$ . This makes it crystal clear that Chester in no way anticipates varying the input sample rate at all, much less to any one of any plurality of differing output sample rates.

Simply put, Chester and all the related prior art is aimed at devices that change an input signal at one input sample rate to another signal at an output sample rate that is a **fixed ratio to the input sample rate**.

The Office Action’s submission that Chester reads on the limitation of “said output sample rate is capable of being varied to any one of said plurality of differing output sample rates for any output data sample” relies on totally inappropriate logic. Because it is clear from the above that Chester clearly is operating at a **fixed** sample rate conversion ratio and **never** teaches anything about sample rates changing with time, the Office Action attempts to rely on “inherent” properties of digital signals.

The jitter (per Pohlman) is generally considered to be a source of noise, distortion or error, it can instead be analyzed as an instantaneous (and typically random) change in the sample rate.

However, the limitation in claim 1 requires “said output sample rate is capable of being **controllably** varied to any one of said plurality of differing output sample rates for any output

data sample". If jitter is to be invoked as the mechanism by which the output sample rates are to be varied, it must be that the jitter varies the output rate among said plurality of output rates that were referenced in the initial limitation of the claim. Instead, it is clear from any understanding of jitter that the variation of rates is random and uncontrolled. The same arguments apply regarding any jitter.

Finally, the Office Action submits in passing that page 2 lines 6-8 of the originally filed specification discloses "the concept of a slowly varying sample rate." Applicant submits that the only reference to slowly varying sample rates is in the detailed description of the present application where it is disclosed that the input to output sample rate ratio L/M can vary slowly with time.

In view of the remarks above it is submitted that independent claims 1, 12, 17, and 23 are allowable. As dependent claims are deemed to include all the limitations of the independent claims, all the dependent claims are also allowable.

#### §103 Rejection of the Claims

Claims 11, 22, 31, and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chester as applied above, and further in view of White (U.S. 5,808,924). However, as dependent claims 11, 22, 31, and 32 are dependent upon allowable claims, they are also allowable.

**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at 408-705-2698 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

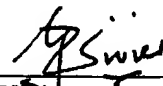
Respectfully submitted,

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Date May 19, 2005

By   
Garth Vivier  
Under 37 CFR §11.9(b)

**CERTIFICATE UNDER 37 CFR 1.8:** The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 20 day of May, 2005.

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